Cotton Outlook

Special Feature

November 2014

Outlook for US cotton production

Sourcing USA Summit 2014 Scottsdale, Arizona

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Cover photo: Cotton harvest on Stricklin Farms in Yazoo County, Mississippi. Image courtesy of John Montfort Jones. To see more Mississippi landscapes and agricultural scenes, visit www.FlatOutDelta.com

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US Cotton Production and the New Textile Industry

By John Scruggs, US editor, Cotton Outlook

Cotton movement, be it in the physical market through supply chain channels or futures prices, challenges stakeholders and participants across the industry. Leading decision makers for US cotton sellers will meet with key buying members from the global textile industry at the November Sourcing USA Summit, presented and produced by Cotton Council International and the US industry on a biennial basis.

Cotlook's special feature published in conjunction with the 2014 Summit offers a range of guest writers tackling topics from US upland and ELS cotton production to climate change in the Texas Plains to US cotton sustainability and textile industry resurgence here in the US.

Texas Tech University Climatologist John Zak addresses the current and future challenges for production agriculture and cotton in particular in the Texas South Plains region, which has seen some easement of the ongoing drought conditions this year but is expected to face warmer temperatures and more erratic rain patterns going forward. Weather and water remain the focus for fiber production in the largest producing state in the US.

Climate and drought are a serious concern for producers in the Far West US cotton belt, and the US Pima crop may see big changes in production next season as a result. Ernie Schroeder Jr., CEO and President of Jess Smith and Sons addresses the Pima market and production outlook at present and going forward into the winter months, when rain and snowfall will be closely watched ahead of spring planting in California. Permanent crop acreage continues to encroach on cotton and take increasing quantities of available water in the region.

Staplcotn Director of economics and internet sales Jason Ward offers his look at competing crop pricing and potential acreage shifts in the coming season. Mr. Ward looks at the four US growing regions and offers his analysis on crop options and viability for alternatives to cotton in each area, along with price relationships and their role in decision making come planting time.

The National Cotton Council's latest push on the sustainability front comes from Cotton LEADS, a program focused on responsibly produced cotton from the US and Australia. NCC President and CEO Mark Lange discusses successes in the program since its 2013 introduction and targets for building upon Cotton LEADS going forward as it works to provide the textile and spinning industry with consistent, responsibly produced raw cotton fiber. With partner organizations, the program is working downstream to ensure apparel companies and customers about their cotton fiber and its production.

National Council of Textile Organizations CEO Auggie Tantillo lays out the numbers showing recent investment in textile operations in the Southeast US states during the last year. His review of recent investment and resurgence in US textile manufacturing looks at drivers behind the shift and trade policy issues that will further affect the industry in the coming years.

At press time, USDA had cut the US crop estimate to 16.3 million bales, which still represented a 20 percent increase from the 2013/14 season. Washington forecasts a marketing year average price range paid to growers at 55 to 65 cents per pound. Recently announced tighter import policies from China have reverberated through the market and China's ending stocks are projected to decrease to 62.16 million bales as mills there consume domestic cotton. Rest of the world stocks are now forecast at 44.95 million bales. The fall in world prices from May through September and into October has made various government support programs more attractive going forward, but fourth quarter 2014 supplies remain tight and nearby prices have been supported as a result. Analysts continue to see the record world stocks as a longer term bearish influence on the market.

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The Future of US Cotton Production

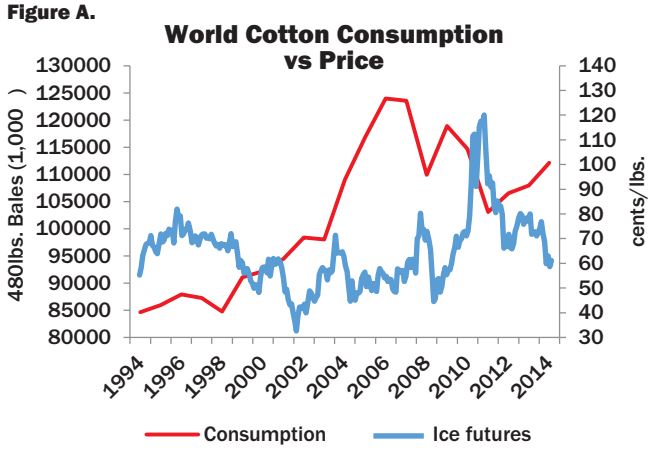
By Jason Ward, Director of Economics, Staplcotn

The cotton futures market, like any commodity market, will move to create an equilibrium between supply and demand. The future of US cotton production will primarily depend upon how much US cotton is needed by the world's textile mills and cotton's price and profitability relative to the prices and profitability of other crops that can be grown in the United States. Of course, government policy often plays a huge role in how much supply or demand there is of a commodity, not just the free market. In the analysis, it is assumed that current governmental policies that affect cotton are more or less held constant. A large assumption considering cotton is the topic of discussion.

In order to analyze the future of the United States cotton industry, assumptions must be made about world consumption. After all, the US cotton industry is one of the most significant players in the global cotton business, particularly from a global trade and price risk management standpoint. (Figure A.) By reviewing just the past 10 years of global cotton consumption, the implications would be that overall world production will have to drop given the loss of demand. However, if the last 20 years of world consumption are assessed, the trend is actually going up, rather than down. An assumption that cotton consumption *can* grow instead of shrink makes more sense given boosts provided by a global population that is growing by 1 billion people every 13 years and economic growth in emerging markets. So, if cotton demand *can* grow, how does it? One conclusion that can be drawn from this chart is that mill demand is relatively healthy and grows, when prices are consistently below 90 cents and abnormal price volatility is not rampant. So, clearly prices have to remain at a sustainable level that promotes both adequate supply and demand. Cotton prices spending the majority of the time in the 60-90 cent range can likely accomplish that goal. Analyzing the demand for cotton cannot be fully realized without reviewing competing fibers, namely manmade fibers. Manmade fiber started to significantly increase its global fiber market share 20 years ago. Through product innovation, cotton's price action and Chinese cotton policy, the last five years exacerbated manmade fibers market share gain. For cotton to stop the erosion of its market share, not only do prices need to stabilize at a reasonable price in and out of China, the cotton industry must also innovate and make cotton products more desirable. Establishing and maintaining growing demand for cotton is a necessity for US cotton producers.

From a production standpoint, US cotton producers are collectively one of the most price sensitive national producers in the world. The US has shifted acres more quickly when market opportunities for other commodities have become more favorable. Because of cotton growers' ability to shift so quickly, multiple commodities need to be analyzed when trying to recognize cotton changes in the past and trying to make predictions

Figure A.

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for the future. In addition to looking at market factors, yield or more prevalent yield potential plays a significant role to US producer decisions.

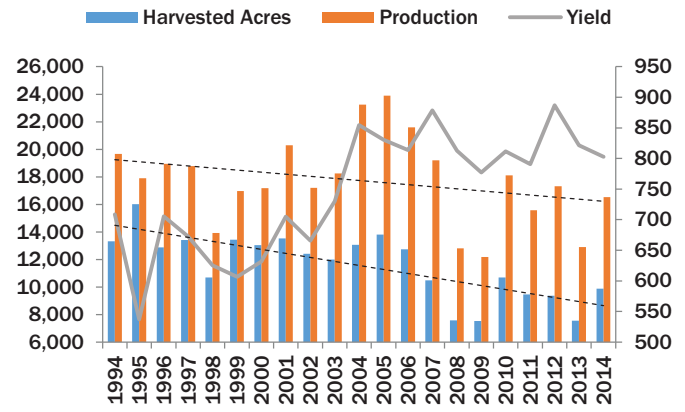
Continuing with the 20-year theme, big picture trends in the US can help explain shifts in cotton farmers' production decisions. Cotton acres tend to compete with corn and soybeans. US cotton acres over the past 20 years have made some very abrupt shifts (Figure B.), with the largest and most permanent occurring during the 2006 & 2007 crop years when the agricultural complex received an influx of demand from ethanol mandates in the US and emerging market demand. On average, US cotton acres shift 13 to 14% with swings as high as 40%. In comparison, corn and soybean acres typically shift only 4 to 5% up or down from year to year. Figure B. represents US cotton acres, production, and yield. The chart demonstrates a downward trend in cotton acres and production, but the overall message should be that production is decreasing at a lesser rate than harvested acres. This is a result of increasing yields on fewer acres. Corn and soybean yields are increasing also, but less steeply than cotton. US corn and soybean acres are only producing approximately 2% and .5% more bushels per acre, respectively, than 20 years ago whereas cotton is producing approximately 3.25% more pounds per acre.

As the food and fuel markets demand more stocks from corn and soybean acres in the United States, cotton acres are at risk if soybean and corn yields don't make up the difference. We can expect to see regional shifts instead of a proportionate national decrease. The Far West has struggled to maintain its acres due to real estate, permanent crops, more profitable alternatives, and water issues. The Far West should plateau, but that may not be until another 100,000 acres are cut over the next two to five years. Pima acres should be able to hold due to its uniqueness, demand, and net value.

The Southwest (primarily Texas) will continue to plant cotton without much elasticity to price and cotton's return relative to other crops. Areas north and east of Lubbock may shift depending on grain prices and weather conditions, but the bulk of the Southwestern cotton acres will remain solid

year after year. However, it must be noted that depending on the Southwest cotton producer to be the primary producer of US cotton leaves a huge gap of uncertainty each year and may contribute to market price volatility. Figure C. shows the wild swings in abandonment and yield for Texas. Its low irrigation capacity combined with the arid climate makes cotton the most suitable crop to be grown in the region, but is also creates a lot of uncertainty around annual production output.

Figure B.



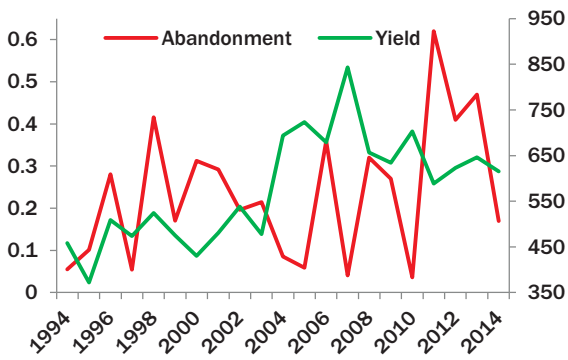
The Mid-South is the region that will be swayed most by market conditions at planting time. Typically this region has good irrigation capacity, good soil, abundant annual rainfall and it enjoys a more predictable weather pattern year after year. Aside from an occasional hurricane disturbance during harvest, the Mid-South is the most ideal growing region for multiple commodities within the Cotton Belt. The soil conditions in this region seem to play a very important role along with the weather when maximizing yields whether it is cotton, corn, or soybeans. Focusing on areas within the Mid-South that typically had a high concentration of cotton, corn yields have made significant strides over the past six years. Soybeans have also improved but not to the extent seen in corn. One significant function, aside from seed technology, is the implementation of furrow irrigation on better soils that once were in cotton. When the corn market made a push after the ethanol mandates, cotton acres in the Mid-South moved to corn. As a result, growers realized the potential for corn on those acres. Soybeans also have been a beneficiary of better soil and irrigation practices when lower soybean stocks pushed the soybean market up and Mid-South growers planted more soybeans.

As for the Southeast, cotton acres are slightly more elastic to cotton prices than in the Southwest but less than the Mid-South. Because of lower production cost on cotton acres in the Southeast versus the Mid-South, cotton's great rotation with peanuts and the region's inability to match the Mid-South's corn and soybean yields on the majority of the acreage due to soil and lack of irrigation, the Southeast should continue to account for a large piece of US production.

For a producer that can grow multiple crops, a decision must be made annually based on market conditions before planting time. Obviously the grower wants to maximize profits, and typically the higher the market price the better the profits. Looking at the input cost and pricing ratios between cotton, corn, and soybeans before planting season will typically indicate what a producer will plant. Other factors like government safety nets and the individual grower's infrastructure constraints factor in to the equation as well, but a reasonable prediction can be made from price ratios. Cotton acres typically gain market share when trading at 25% of corn and 10% of soybeans. Depending on the market levels, cotton has captured acres closer to 20% and 9%, of corn and soybeans, respectively, on years that corn was trading at or below 40% to soybeans. If these ratios were applied today, to this next year, cotton is more competitive with corn than soybeans, but is below both, and we would therefore expect a slight reduction in cotton area if these ratios hold constant. However, in the future when cotton prices rebound relative to the other crops, we would continue to expect cotton acres in the US, particularly in the Mid-South, to respond.

For the most part, US corn, cotton, and soybean futures prices have been at levels that have been profitable for producers throughout the US Cotton Belt for the last three to four years. Decisions were being made that maximized the farm's profit margins based on yield and market positions. With corn, soybeans and cotton all seemingly in oversupply situations, it will be tougher times for producers in the coming year.

Figure C.

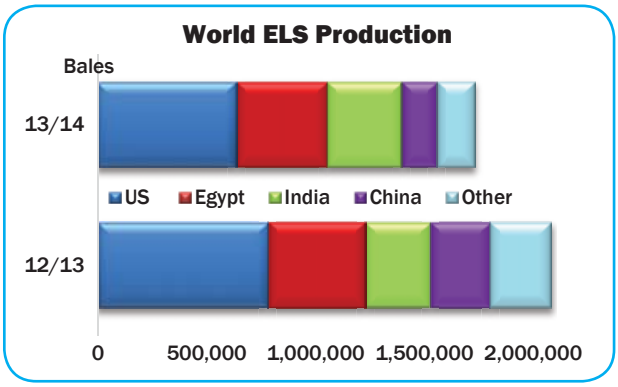


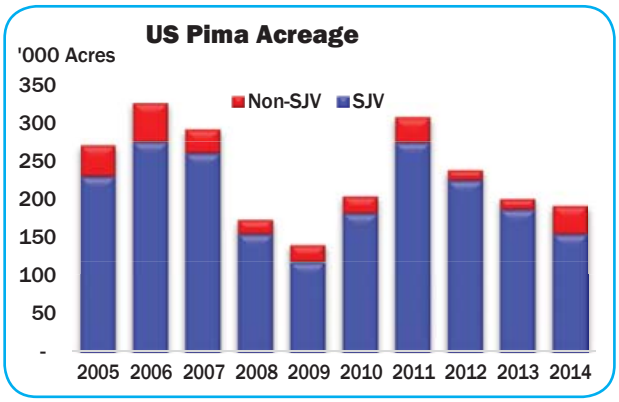
Extra Long Staple To Remain Tight in 2014/15 Season

By Ernie Schroeder Jr., CEO Jess Smith & Sons

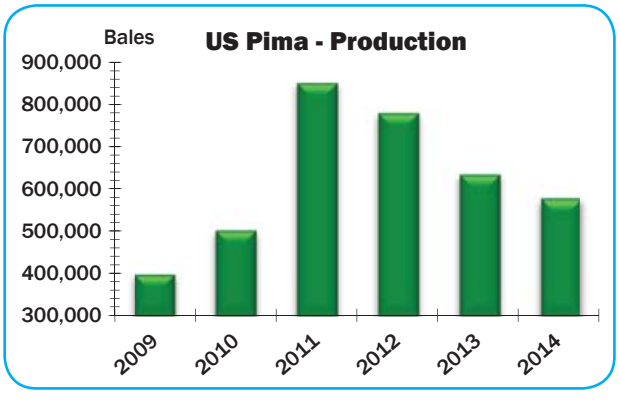
As World Upland stocks built up to record levels, Extra Long Staple cotton followed a different path. Planting of Pima in California was limited by severe drought conditions. Chinese ELS Production found it difficult to compete with the incentives provided to Upland cotton. As ELS prices rose last season, mills found profitability difficult and consumption weakened. In the current season, lower supply of ELS has encouraged producers to seek higher prices, while weaker demand has allowed mills to wait until they must buy before covering their needs. In this discussion, we will review prospects for World ELS Supply and Demand, to understand how these factors could influence ELS prices in the upcoming season.

ELS Prices in the 2013/14 season rose sharply to the second highest levels ever. Strength in the market reflected sharply reduced supplies. World Production of ELS dropped in the 2013/14 season by 17%, 350,000 bales less than the previous season. US Pima dropped due to water concerns in the SJV. In China, with a government procurement program paying more for Upland cotton than ELS, Chinese production fell over 40%. Egypt production fell by about 10% while production of ELS in Sudan dropped 65,000 bales to just 5,000 bales. With reduced production, world ELS prices rose to over $2.00 per pound landed at the mill for US Pima. Higher prices rationed demand, with ELS stocks scarce at the end of the 2013/14 season.





With prices high as growers began to plan for the 2014 season, the expectation might have been for increased production. However, the water outlook in the San Joaquin Valley pushed US Pima acreage lower. In competition for limited water, even at over $2.00, Pima does not challenge what permanent crops such as grapes, almonds and pistachios would be willing to spend to keep trees and vines alive. SJV planted Pima acreage fell almost 19% but this was partially offset by doubling of acreage outside of SJV.



Despite projected record yields, production of American Pima will fall for the third consecutive year. A crop around 560,000 bales will be 75,000 less than last season. This will remain larger than the 2009 and 2010 US Pima crops, but will fall below expected exports. More than 10% of the American Pima crop will be produced outside of the SJV for first time since 2006.

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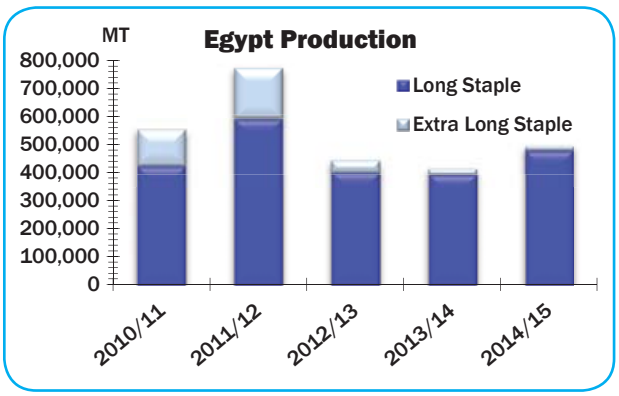
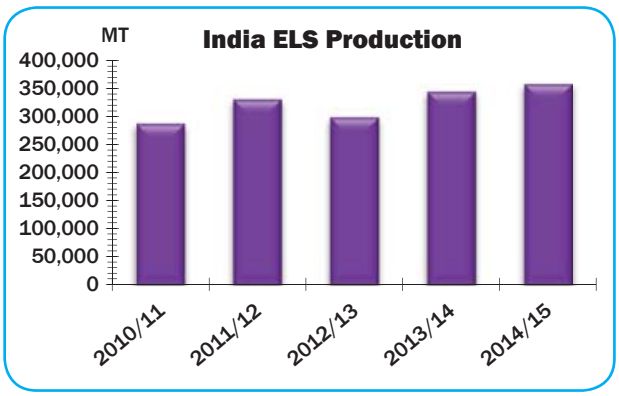
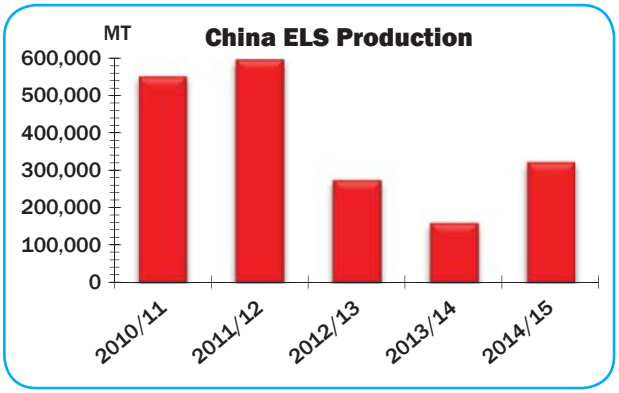
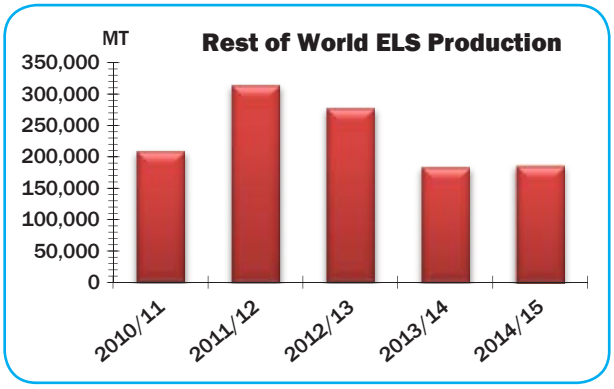
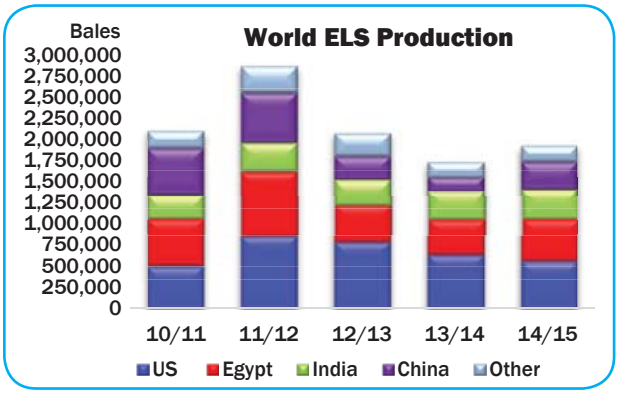

MT
Egypt Production
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
Long Staple
Extra Long Staple
2010/11
2011/12
2012/13
2013/14
2014/15


MT
India ELS Production
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2010/11
2011/12
2012/13
2013/14
2014/15

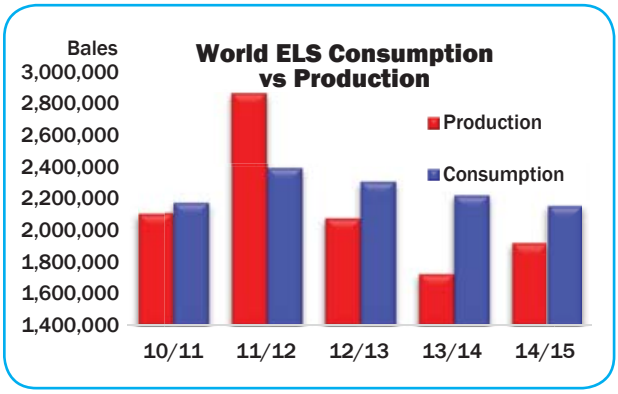

MT
China ELS Production
600,000
500,000
400,000
300,000
200,000
100,000
0
2010/11
2011/12
2012/13
2013/14
2014/15


MT
Rest of World ELS Production
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2010/11
2011/12
2012/13
2013/14
2014/15

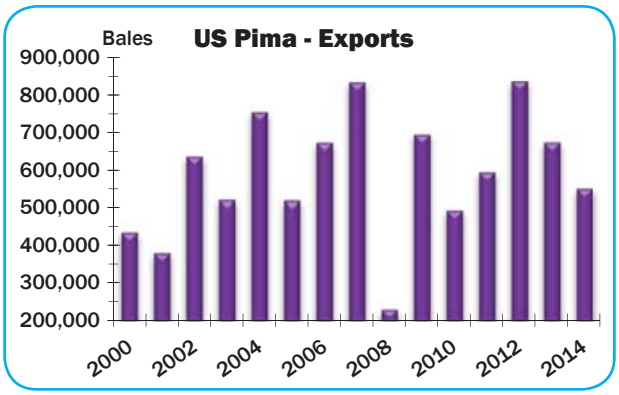


While US ELS production dropped, it is anticipated that ELS production may rise elsewhere in the world. With almost a 30% increase in planted acreage, the Egyptian crop is expected to rise by 80,000 bales to 500,000. However, Egypt made a dramatic shift of acreage away from ELS varieties. The increase in production will occur in varieties such as Giza 86, which produces a shorter staple than US Pima and Chinese ELS. With higher ELS prices in China, many anticipated a possible large increase in planting. However, lacking details about how the "Target Price" program might work, the increase was less than possible. Still, production of Chinese ELS is anticipated to reach close to 320,000 bales this season, double last year's figure. While most Indian ELS is not as long and strong as US Pima, it will see a small increase in production this year. Outside the four largest producers of ELS cotton, the rest of the world will be practically unchanged. Overall world ELS production is projected to rise to 1.925 million bales, about 10% larger than last season. Still at this level, world ELS production is the second lowest in the last 30 years.

World consumption of Extra Long Staple cotton is difficult to summarize. There are not exact measurements of what is officially ELS. Some estimate consumption by country but arrive at a total too low, as they have world figures where world ELS exports are always 300,000-600,000 bales more than World ELS imports, an impossible feat. Perhaps the best way to estimate world ELS usage is to add the difference between Imports and Exports to the estimated consumption. This series more correctly reflects long term trends. World consumption has now fallen every year since the 2011/12 season, and is projected to drop again this year with prices remaining above long term averages. However, even with this decline, world ELS use may remain above the world ELS production for the 3rd consecutive season. World ELS usage is expected to be a little over 2.1 million bales, 100,000 less than last season. Mill demand remains quiet as mills wait until closer to harvest to cover their needs. Usage is down, but with world stocks expected to tighten, prices are expected to remain above long term levels.

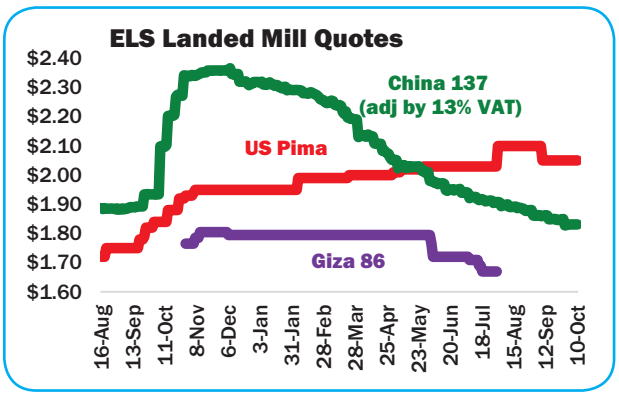


US Pima Export Sales as of the beginning of September were about 65,000 bales. This pace is slower than the last few seasons, representing only about 12% of estimated US Pima exports this season. At 550,000 bales, sales are expected to be 123,000 less than last year and 286,000 less than 2 years ago. The slow pace of sales mostly reflects mills who are cautious of buying when prices are relatively high and their business is slow.



As ELS cotton goes into fine count uses, supplying a product with the least amount of contamination is a goal for US producers. In 2013, mills found a few cases of sticky cotton, that made spinning more difficult. Jess Smith & Sons understands the importance of this issue to the textile mill. We have worked to make our growers aware of the serious nature of this problem. We have even gone a step further in testing each bale of cotton as it arrives at our warehouses. Taking this extra step allows us to prevent serious mill problems and protect our buyers. Growers have worked hard to eliminate this problem, and it is not expected to prevail again this season. A prudent buyer should always demand this testing be done so that they are not surprised.

In the 2013/14 season, ELS prices began to increase in the summer of 2013. At harvest in China, their ELS prices jumped sharply. Once rationing occurred, Chinese ELS prices began to decline at the beginning of calendar year 2014. That trend has continued and current Chinese prices (after adjusting for the 13% Value Added Tax) are lower than US landed mill prices. US

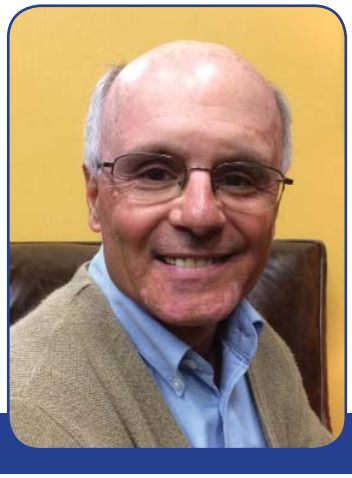


prices have remained steady since November 2013. With the US Pima crop expected to be slightly smaller, the early expectation was for an increase in price. However, with world ELS production larger than last year and world ELS consumption lower, it now appears the upward pressure has been relieved. Still world stocks of ELS are expected to be relatively low, which could support prices from a sharp decline.

This season, mills will discover the importance of fiber strength and length. With the reduction of ELS in Egypt, more attention may focus on the longer staple US Pima cotton. Mills will need to watch this factor closely, as a shortage of longer staple cotton may support ELS prices. A mill buying hand to mouth may discover that when they finally cover their needs, the quality needed is in very short supply.

While the current outlook suggests that prices will trade in a range from above average to last season's high, we have seen that the ELS market often does not follow its initial instincts. Mills and growers are reminded to keep a vigilant eye on Pima prospects, both on the crop and on demand, for signs that might change current projections.

A major factor affecting actual prices this season will be the water prospects in the San Joaquin Valley for the 2015 season. Early indications of even less water and depleted reservoirs are predicted for next season. We may see little improvement in these predictions with a dry fall forecast. When assessing the impact of the situation at hand, one may assume that this season's supply might actually need to extend into the upcoming season. This means the small crop this year needs to supply needs of a mill for two years, as acreage will decline in the SJV. While Pima prices and yields may appear good enough to encourage planting, limited water will primarily be used to satisfy needs of permanent crops, such as almonds and pistachios.



Climate Change and Cotton Production in the Southern High Plains

John Zak (pictured), Texas Tech University - Climate Science Center,
Jeanne Schneider, USDA Southern Plains Regional Climate Hub, and
Bobbie McMichael, Department of Biological Sciences -TTU

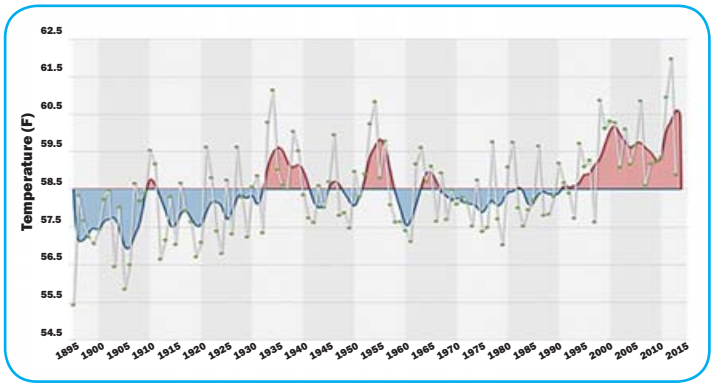
Cotton farming across the Southern High Plains (SHP), the center of cotton production for the US, is highly dependent upon adequate rainfall to supplement irrigated acres and especially for dryland farming. During months when rainfall is inadequate or the period between rainfall is long, farmers with access to groundwater supplied from the Ogallala Aquifer rely on irrigation to maintain a positive water balance. However, the peak in irrigated cotton for the region was reached in 1974 and has been declining since, as the amount of available water in the aquifer has declined with little or no recharge to compensate for withdrawal. Yearly variation in precipitation totals, rainfall frequency and amount of rainfall per rainfall event, hail events, and higher than average maximum temperatures are a hallmark of the Southern High Plains and complicate the ability of producers to manage for climate variability for both irrigated and dryland acreage. Even when the growing season begins with adequate moisture and optimum growing temperatures, mid-summer extremes in temperature or lack of monsoonal moisture can quickly lead to a poor stand of cotton. If there is one consistent climate feature of the Southern High Plains, it is that climate variability has been and will continue to be is a major factor determining the yearly success of cotton production systems. Unfortunately, that variability has been increasing over the last 15 years. With climate models indicating that climate variability will likely continue to increase with over the next fifty years on the SHP, the challenge for producers will be to develop management practices that support dryland production under very different growing conditions then they experience currently.

Historical Climate Variability for the South High Plains: What does it look like?

Successful cotton production is very much linked to winter and spring precipitation that builds suitable soil moisture within the rooting zone, and provides for optimum soil temperatures prior to planting for maximum germination. Once seeds have germinated and seedling growth has started, adequate rainfall and optimum soil and air temperatures during the summer are necessary for maximizing flower production and boll development. Cotton production on the SHP had the largest period of expansion in acres planted from 1960 through 1995 when the region experienced almost

thirty-five years of steady average yearly temperatures with low annual variability as compared with the period 1895-1960 (Figure 1). After 1995 the region begin to experience an increase in the average yearly temperature above the historical average (red line). During the 2011- 2012 drought (Figure 1) the region experienced the highest yearly average temperature on record. Moreover, the average yearly temperature has been above the historical average since 1998 for the region. For cotton producers the higher average yearly temperatures implies dealing with increasing winter temperatures, detrimental for maintaining soil moisture, and higher summer temperatures that increase evapotranspiration. With higher overall temperatures farmers must either increase irrigation or rely on rainfall to meet increased evaporative demand during the summer. The current warm period across the SHP is longer than any recorded since 1895, indicating that analysis of the historical data may not be as useful in assisting producers in planning or adapting to climate variability over the next ten to fifty years as climate projections.

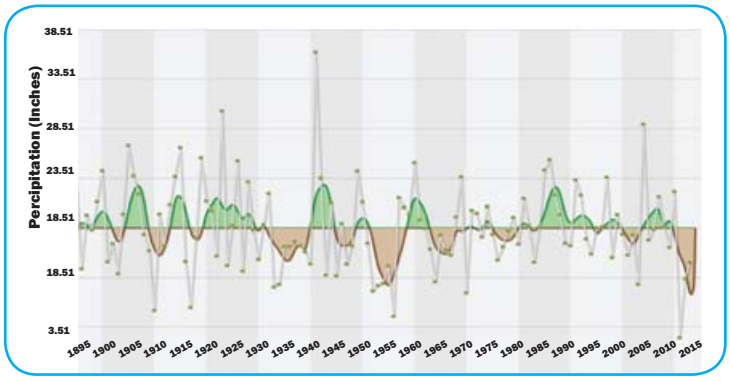
Figure 1.



Coincident with the more favorable temperatures that have preceded the current warm period on the SHP, total rainfall was at or above historical averages during the same period (Figure 2). The SHP has always been characterized as having high precipitation variability. However, the recent period of cool wet weather from the late 60s through 2000 has been the basis for much of the management procedures developed for cotton production on the SHP. This period of wetter weather will not likely occur in the future based upon model projections.

If the last several years are any indication of future conditions, we will likely see higher winter and summer temperatures in some years, less total precipitation coupled with highly variable precipitation events, and increasing periods of drought.

Figure 2.



Water – Climate Interactions and Cotton Production

Increasing climate variability and decreasing groundwater do not bode well for producers across the SHP as increasing variability equates with less control and higher uncertainty. Installation of sub-surface drip can decrease water consumption but may not be able to compensate for less rainfall and higher temperatures. Researchers at Texas AgriLife Extension Service and Texas Tech University estimated that if all the current irrigated acres on the SHP were converted to dryland, the region would suffer an annual net loss of $1.6 billion. To place the impact from moving all irrigated acres to dryland into perspective, Texas AgriLife Extension Service estimated that for the 2011 drought the economic loss across Texas was $1.8 billion for cotton. Under increasing climate variability and decreasing water supply is irrigated cotton on the SHP sustainable or even possible? USDA-ARS researchers in Lubbock have indicated that management of planting times

and irrigation schedules coupled with genetic trait selections that allow crops to adapt to increasing levels of drought may buy some time. Water amounts, either obtained through rainfall or from groundwater, will control all production outcomes regardless of any change in plant genetics. The level of climate variability and the rate at which the variability is expressed will be the deciding factors in ascertaining if and how producers can adapt. Developing soil and crop management approaches that better manage the climate variability may allow producers to break even in bad years and achieve economic profitability in better years. For producers across the SHP the race to adapt and survive is on.

What will the SHP Climate Look like into the Future?

Based upon current Global Circulation Model projections, rainfall amounts across the SHP will be influenced by the amount of warming that occurs across the globe. A 1.0°C rise in global mean surface temperature is projected to increase spring rainfall in the region while causing an increase in summer droughts (Figure 3). A global mean surface temperature rise from 2 - 4°C, will result in increased drought conditions prior to and at planting time, limiting dry-land production and increasing the need for (increasingly scarce) supplemental irrigation to establish the crop. For summer conditions, any change in average mean global surface temperature is likely to result in drier conditions that worsen as global temperatures increase (Figure 3).

Using the CMIP 3 global models results, the Texas Tech University-Climate Science Center has developed high resolution downscaled projections of changes in temperatures and cumulative precipitation for the SHP that better focus regional projections. A portion of those results are reported in Figure 4. For the period from 2020 thru 2039, the region will likely experience higher average yearly temperatures of around 2°C warmer. That temperature change will result in differences in precipitation, with some runs indicating a decrease and others indicating an increase, depending upon the outcome from the larger GCM. When you look at the period from 2050 to 2069, average annual temperatures may be up to 4°C warmer with more variable precipitation.

By season, winters for the SHP for the period 2020 to 2039 can be up to 3°C on average warmer, with the models indicating a potential for more rainfall than what has occurred for the 1960 – 1979 period. Later in the century most models indicate increased precipitation and substantially warmer average winter temperatures from between 0.5° and 6°C. While more winter precipitation may become available in the coming decades for the SHP, evaporation will also increase with higher winter temperatures.

Model outputs for the summer are highly variable with changes in average summer temperatures up to a 3°C increase. During the middle of the current century, model projections indicate greater variability in temperatures and precipitation, with some output indicating up to a 50% reduction in precipitation with a 5°C increase in average summer temperatures. On the positive side, some model runs indicate a 50% increase in precipitation. The higher precipitation is accompanied with higher average summer temperatures. Changes in the number of hot days (greater than 90°F) and in the interval between rainfall events will also present significant challenges to achieving sustainable cotton production, even if total precipitation is the same or higher. For the period 2020 to 2039, model output indicates there will be an increase in the number of hot days by up to 40 days annually across the region. The number of dry days could either increase by around 10 or decrease by 10, leading to greater yearly variability. From 2050 to 2069 the region will see an increase of 90°F days of at least 20 days and potentially up to almost 80 days. Under these conditions the majority of the model runs indicate an increased number of dry days of up to 15 days per year.

The variability in model projections reported here are partly due to including a range of possible scenarios due to (yet unknown) worldwide increases in greenhouse gases between now and 2069, and partly due to scientifically sound modeling practices. Regardless, the net result is high confidence that conditions enjoyed by cotton producers in the SHP during the late 20th century will not return.

Conclusions

The SHP will experience greater yearly variability in precipitation amounts, greater variability in rainfall frequency, gradually warmer summer

and winter average temperatures, and greater numbers of hot days through the next 50 years. With decreasing groundwater supplies, much of the regional cotton production will have to switch to dry-land. The challenge for producers on the SHP will be to develop soil and crop management practices that allow for adaptation during periods of low to moderate variability in precipitation and temperatures. These adaptations may include changes in planting times or managing soil temperatures and evapotranspiration rates. For those years in which climate variability results in drought development, or large temperature swings impacting crop growth, ecological adaptation will not suffice and an economic solution is needed to maintain producer sustainability. For example, cotton insurance programs may have to begin to include short-term climate projections linked to weather forecasts in setting their payment programs rather than having a farmer attempt to plant when conditions for a given year are projected not to be at all conducive to achieving a viable crop.

Figure 3.

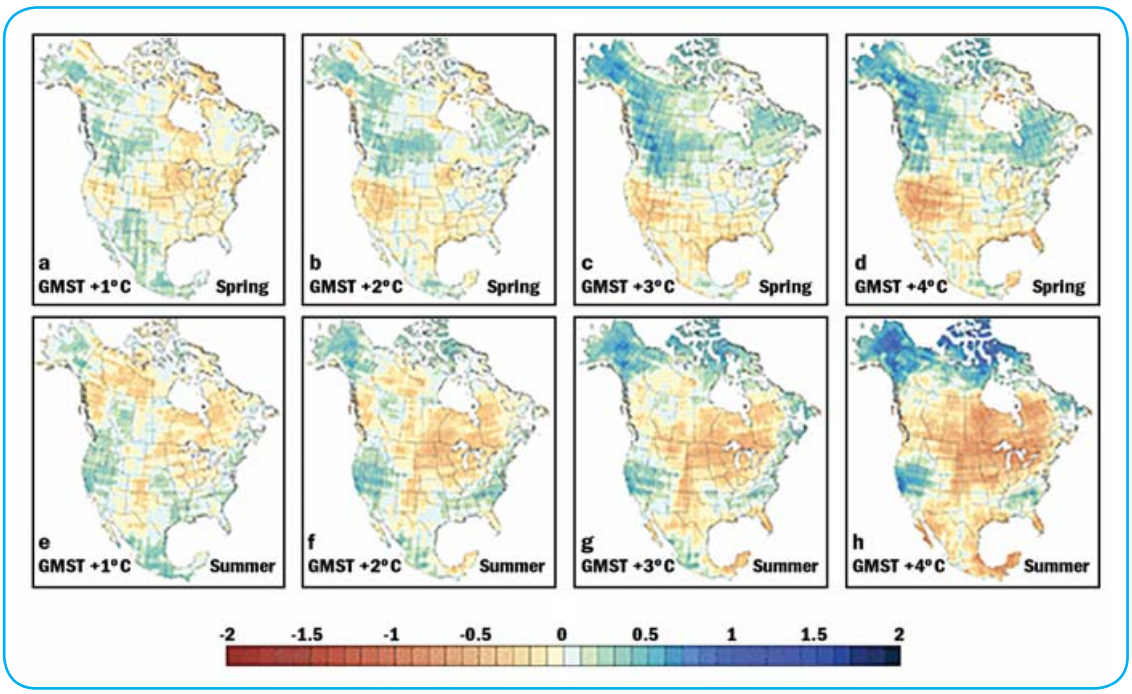


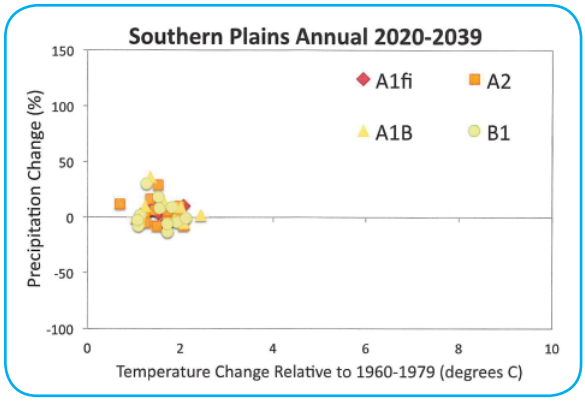
Figure 1. Average yearly temperatures for the Texas Panhandle portion of the Southern High Plains. The red line at 58.5°F is the historical yearly average temperature for the region. The blue curve reflects cooler than the historical average temperatures, while the red curve indicates above historical temperature averages for a 5 year running average. Figure obtained from the Southern Climate Impacts Program.

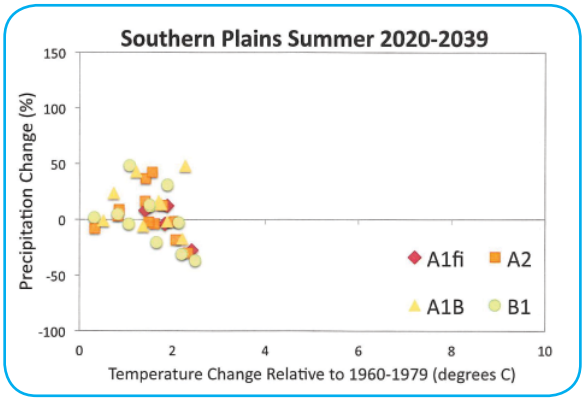
Figure 2. Total yearly precipitation for the Texas Panhandle portion of the Southern High Plains. The brown line at 18.51 inches is the historical yearly total rainfall received for the region. The brown curve reflects drought periods were the 5-year running total was below the historical average, while the green curve indicates pluvial conditions, when rainfall was above the historical average for a 5 year running average. Figure obtained from the Southern Climate Impacts Program.

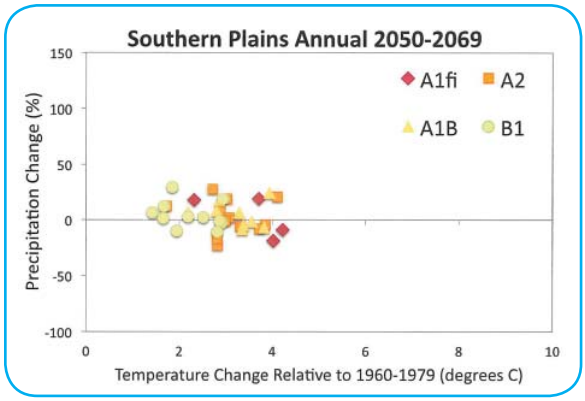
Figure 3. Model projections of Standard Precipitation Index anomalies in response to a 1 to 4°C increase in Global Mean Surface temperatures for spring and summer conditions across North America compared to the historical period of 1971 – 2000. Green and blue colors indicate wetter periods while yellow and brown areas indicate drier conditions. The color bar in the figure indicates the amount of change from the historical data.

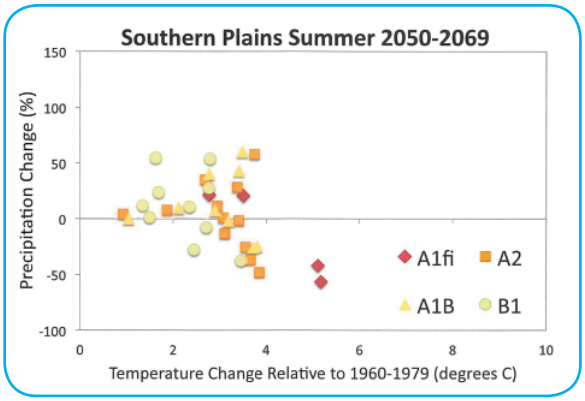
Figure 4. Downscaled future projections of temperature, precipitation and dry-days for the Southern High Plains based upon Coupled Model Inter-Comparison Project version 3 output (CMIP3) at four different emission greenhouse gas emission levels (A1fi –highest; A2 – mid-high; A1B-mid-low and B1 lowest). Figures obtained from: Development and Dissemination of a High-Resolution National Climate Change Dataset; Final Report - 2013, USGS). Each figure includes four emission scenarios and multiple runs of the models to account for slightly different conditions.

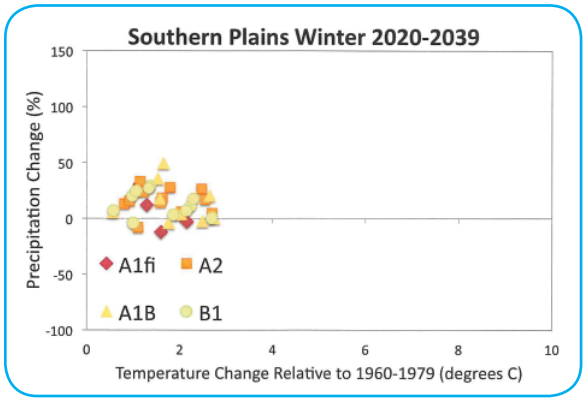
Figure 4.

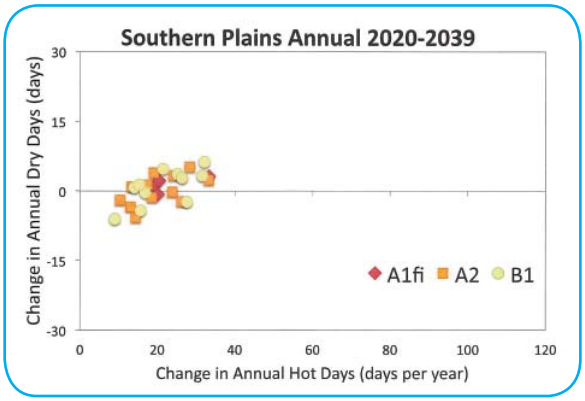

Southern Plains Annual 2020-2039
Precipitation Change (%)
Temperature Change Relative to 1960-1979 (degrees C)
A1fi
A2
A1B
B1

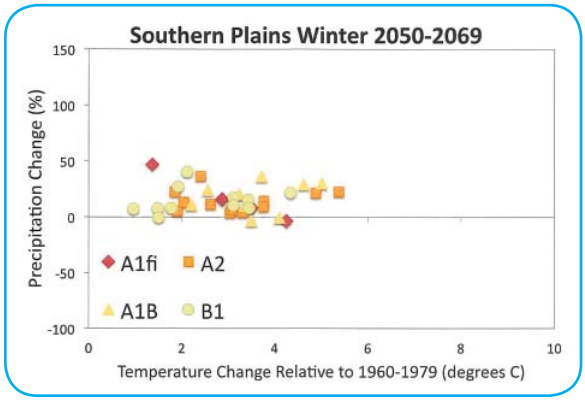

Southern Plains Summer 2020-2039
Precipitation Change (%)
Temperature Change Relative to 1960-1979 (degrees C)
A1fi
A2
A1B
B1

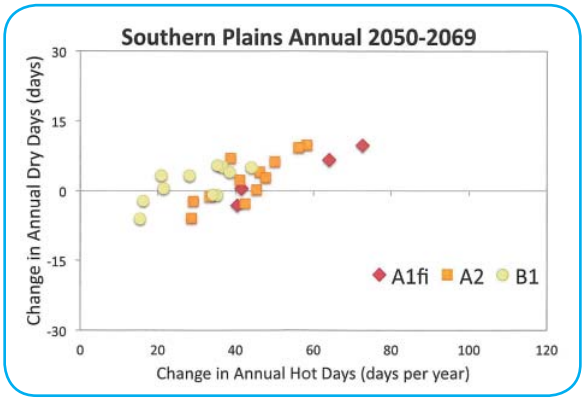

Southern Plains Annual 2050-2069
Precipitation Change (%)
Temperature Change Relative to 1960-1979 (degrees C)
A1fi
A2
A1B
B1


Southern Plains Summer 2050-2069
Precipitation Change (%)
Temperature Change Relative to 1960-1979 (degrees C)
A1fi
A2
A1B
B1


Southern Plains Winter 2020-2039
Precipitation Change (%)
Temperature Change Relative to 1960-1979 (degrees C)
A1fi
A2
A1B
B1


Southern Plains Annual 2020-2039
Change in Annual Dry Days (days)
Change in Annual Hot Days (days per year)
A1fi
A2
B1


Southern Plains Winter 2050-2069
Precipitation Change (%)
Temperature Change Relative to 1960-1979 (degrees C)
A1fi
A2
A1B
B1


Southern Plains Annual 2050-2069
Change in Annual Dry Days (days)
Change in Annual Hot Days (days per year)
A1fi
A2
B1

Enhancing Cotton Demand via Cotton LEADS™

By Mark Lange, President and Chief Executive Officer
National Cotton Council of America

Since initiated in 2013 to raise awareness of the significant environmental gains already achieved by Australian and US cotton producers and their commitment to continual improvement, the Cotton LEADS™ program is helping push US and Australian cotton through the global textile supply chain.

Cotton LEADS™ was founded by Cotton Australia and The Cotton Foundation to encourage continued responsible cotton production practices and sustainability as well as the dissemination of best practices information broadly throughout the world's cotton producing countries. Driven by producers, scientists and professionals wanting to ensure cotton is produced responsibly for years to come, the no-cost, no-certification effort has the strong backing of the Australian Cotton Shippers Association, Cotton Incorporated, the National Cotton Council and its export promotions arm, Cotton Council International.

The program originally was initiated by the Australian and US cotton industries to draw attention to their cotton producers' environmental advances. Why? Both of these countries' cotton producers operate in transparent, regulatory environments unlike anything faced by the world's other cotton producers.

Producers in both the United States and Australia -- which account for roughly 17 percent of global cotton production -- can demonstrate they are ahead of the game in providing responsibly produced cotton to the textile marketing chain. They are leaders in resource efficiency, including water/land use, pest management, soil conservation, energy/greenhouse gas reduction and bale traceability. Measures of their environmental gains over the past 30 years have been documented by government agencies and other third parties.

What's more, Australian and US cotton producers annually devote $20 million and $50 million, respectively, to agricultural research. That work has fostered the development of their leading edge production practices as well as an understanding of their regulatory responsibilities. Specifically, these investments: 1) enable them to achieve continual and substantial environmental improvements; 2) eliminate the alternative of farm level certification programs; and 3) extend the research activity beyond the farm gate to all sectors associated with the manufacture of cotton yarns, textiles and apparel.

Regarding those leading edge production practices, Cotton Australia CEO Adam Kay says, "This self-investment by growers into research and development is a shared undertaking in both countries, and one that demonstrates their commitment to continual improvement."

Cotton LEADS™ activities are being guided by a committee comprised of three members from each of the founding member countries. Validating the program are: 1) national-level oversight, 2) regulatory enforcement and 3) transparency of business practices common to the United States and Australia cotton industries. The potential for future participation is great, considering there are more than 20 million cotton producers in 77 countries.

The Cotton LEADS™ program is based on five core principles consistent with sustainability, the use of best management practices and traceability in the supply chain. Those are: 1) COMMITMENT – to the social, environmental, economic and regulatory factors to produce world-class cotton, 2) RECOGNITION – that sustainable and responsible

cotton production requires continual improvement, investment, research and sharing of best practices information among growers and industry, 3) UNDERSTANDING – that leading change in responsible and sustainable cotton practices will have the most positive impact when implemented in collaboration with farm, regional, national and international programs, 4) BELIEF – in the benefit of working cooperatively with similar programs that seek to advance responsible and sustainable cotton production in an effort to keep global cotton competitive in world fiber markets, and 5) CONFIDENCE – in a cotton identification system that ensures traceability from farm to manufacturer.

Cotton LEADS™ overarching goal is for textile manufacturers, brands and retailers to have access to conscientiously-produced raw material. Adding to these cotton end users' confidence is that Cotton LEADS™ is demonstrating how the United States, Australia and potential joining partner nations can supply this quality fiber. For example, US and Australian cotton is identified on-farm by a module ticket. When the cotton is ginned, each bale is assigned a unique bale identification number. In Australia, the bale identification is linked to the module and cotton quality data. In the United States, the bale identification is linked to the gin (which in turn provides linkage to a producer) and cotton quality data.

Yarn spinners, textile and apparel manufacturers, retailers, brands and even other cotton industry firms can become Cotton LEADS™ partners by specifying that cotton in the program will be considered in their sustainable sourcing guidelines and signing the "Commitment to Cotton."

Companies and organizations can have additional involvement in the program by supporting research at the field level, disseminating best practices information and creating partnerships for continuous global production improvement. For example, current research, being supported by the founding member countries, ranges from precision fertilizer application management to sensor demonstrations for irrigation scheduling.

By encouraging a reliable supply of responsibly-produced raw fiber for the global cotton industry, the program continues to attract the involvement of textile business globally.

Mark Messura, senior vice president, Global Supply Chain Marketing at Cotton Incorporated, said the Cotton LEADS™ program's founding partners are gratified that so many businesses around the world recognize the ongoing environmental gains made by cotton growers in Australia and the United States.

Messura noted that Cotton LEADS™ also was designed to have minimal interference in the market and not impose additional costs on producers, supply chain companies or retailers and brands.

"That's helping cotton compete for market share among other fibers, including man-made fiber," Messura said. "And we believe Cotton LEADS™ should help in maintaining or even increasing global demand for cotton – as the positive perception of the fiber will be elevated."

Just one year after being launched, Cotton LEADS™ now has more than 200 partners. That includes many prominent US yarn spinners and textile and apparel manufacturers – suppliers to some of the world's most recognizable brands. Partners also include many of those key retailers and brands such as Target, Brooks Brothers and Gerber Childrenswear. All of these companies have formally acknowledged the merits of Cotton LEADS™ cotton and now include it within their sustainable sourcing guidelines. A list of partners, along with more information about Cotton LEADS™, is at: www.cottonleads.org.

These partners also acknowledge that their use of Australian and US cotton, grown under those countries' strict, transparent regulatory environments, helps assure their customers of their company's commitment to sustainability and traceability in the cotton used in their products.

In explaining how the Cotton LEADS™ program fits into Brooks Brothers' sourcing needs, Joe Dixon, the company's senior vice president of Production and Technical Services, said, "Brooks Brothers is enthusiastically committed to sustainable sourcing. Because cotton continues to be a mainstay of Brooks Brothers' product offerings, we require significant amounts of high quality, responsibly-produced cotton fiber. We look to a range of opportunities that, like the Cotton LEADS™ program, can demonstrate best practices, reduced environmental impact, and make a commitment to ongoing improvement and traceability."

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The Re-shoring of US Textile Manufacturing

By Augustine Tantillo, President and CEO
National Council for Textile Organizations

The US Textile Industry – Thriving Again

The US textile industry is a globally competitive and cutting edge innovator across the broad spectrum of textile and apparel end uses. Whether it is protecting our men and women in uniform or developing high performance textile products for the private and public sectors, the US textile industry is a world leader in research and development.

The US textile industry is a major contributor to the US economy. In 2013, US textile shipments totaled $56.6 billion, an increase of more than 5% over 2012. The US textile industry is the third largest exporter of textile products in the world. Exports of US textile products were nearly 18 billion in 2013, an increase of nearly 5%. Over the past 10 years, the US textile industry improved productivity by 24%, making the industry one of the top among all industrial sectors for productivity increases. A substantial employer of American workers, the US fiber, textile, and apparel production chain supplied nearly 499,000 jobs in 2013. Additionally, the US government estimates that every textile job in this country supports and creates three additional jobs.

According to the most recent US census data, the industry has seen continuous investment and growth. From 2001 to 2011 the US textile industry invested $17.7 billion in new plants and equipment.

Moreover, during the past 12 months the industry has seen a substantial increase in foreign direct investment and domestic expansion projects. Since August 2013, textile companies from China, Canada, India, Korea, and Mexico have all announced new investment plans in the United States. Attracting foreign investors are several macro-economic advantages that are boosting manufacturing in the US including: energy costs, raw material costs, transportation costs, speed to market, consumer demand, and positive trade policies such as the yarn forward rule-of-origin. These factors, paired with rising labor costs in China and other countries, have positioned foreign textile manufacturers to consider American sites. Over this time, we have seen no fewer than six foreign and five domestic companies make public announcements to invest more than $1.9 billion in new textile facilities and equipment in the United States. These investments are projected to provide approximately 3,000 new jobs in North Carolina, South Carolina, Georgia, and Louisiana.

Positive Trade Policy – A Key Driver of the Resurgence

Beyond the basic macro-economic factors listed earlier, the key driver for this recent investment surge has been the success of positive US trade policy in the textile sector. Over the past 25 years, the US completed a series of free trade agreements that include a yarn forward rule-of-origin for textile and apparel products. This rule has served as a catalyst for the record breaking exports of US yarns and fabrics that we are seeing today. In fact,

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Some of these investments include:

Company	Company Nationalality	Investment Location (s)	Investment Amount	Estimated Jobs Created
Yarn spinning				
Gildan	Canada	Salisbury, NC Mocksville, NC	$250 million	500 - 700
Parkdale	USA	Raburn Gap, GA	$85 million	210
Shrivallabh Pittie Group	India	Screven County, GA	$70 million	250
Gulf Coast/Zagis USA	Mexico	Bunkie, LA	$130 million	300
Keer	China	Lancaster County, SC	$218 million	500
Nonwovens				
Owens Corning	USA	Gastonia, NC	$120 million	110
Fitesa Simpsonville, Inc.	USA	Simpsonville, NC	$50 million	32
Custom Nonwoven, Inc.	Korea	Thomasville, NC	$12.8 million	72
Composites & Technical Fabrics				
Toray Industries, Inc.[1]	Japan	Moore, SC	(close to) $1 billion	500
Highland Industries, Inc.	USA	Cheraw, SC	$4.1 million	24
Louis Hornick and Co., Inc.[2]	USA	Allendale, SC	$2.5 million	125
Total			$1.9 billion	2,823

1 Toray plans to acquire Zoltek Companies, Inc., St. Louis, MS for approximately $584 million. 2 Involved relocation of its operations to SC from NY

Source: Department of Commerce, Presenation "OTEXA": Helping to shape Trade Domstic policy"

over the past 10 years textile exports have grown dramatically from $12.7 billion in 2003 to $17.9 billion in 2013, a 40% increase during that period.

As the name implies, the yarn forward rule requires that yarn, fabric, and assembly production steps be completed in a free trade region in order to qualify for duty-free preference into the US. This rule has created an integrated Western Hemisphere production chain between the US and its NAFTA and CAFTA trade partners. The US is exporting record levels of yarns and fabrics to these partners, which are then processed into finished apparel and textile home furnishings products that are shipped back to US duty-free for purchase by consumers. Nearly two-thirds of US textile exports during 2013 went to our Western Hemisphere free-trade partners.

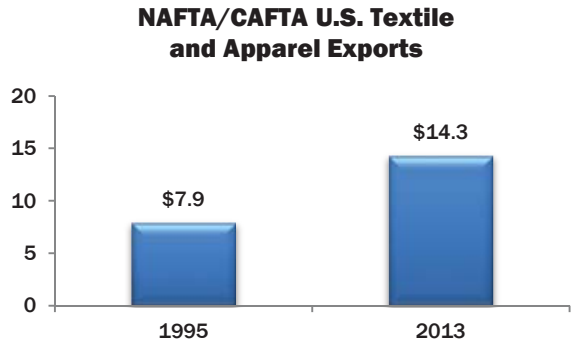
The charts demonstrate the dramatic growth of two-way trade between the US and our NAFTA/CAFTA trading partners since the yarn forward rule was first introduced.

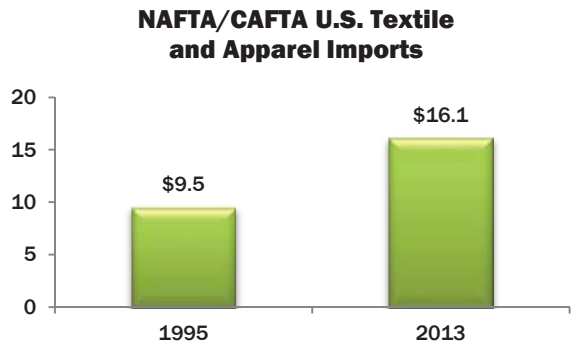
As exemplified in the charts, due to positive US trade policy, the US and its Western Hemisphere trading partners have created a prosperous and sustainable integrated manufacturing platform. This partnership provides millions of manufacturing jobs throughout the Western Hemisphere and billions of dollars in two way trade.

Looking Ahead – The TPP

As the US textile industry experiences the benefits of strong trade policy, significant international trade developments such as the Trans-Pacific Partnership (TPP) loom on the horizon. The TPP is an effort to establish a free trade bloc among 12 Pacific Basin nations. The agreement is intended to remove various trade barriers between the TPP countries in virtually all areas of commerce, including manufactured products and services. In addition to the United States, the other TPP nations are Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam.

Negotiation of the TPP will be the most significant free trade agreement developed in over 20 years in terms of how it impacts textile and apparel manufacturing jobs, production, and exports in the US and throughout the rest of the Western Hemisphere. This is mainly due to the inclusion of Vietnam and the potential impact Vietnam poses to manufacturers that make up the textile and apparel





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supply chain in the Western Hemisphere. These concerns are principally driven by the size of Vietnam's apparel industry, and their dramatic export growth in recent years. Vietnam is the second largest supplier of apparel to United States market, shipping over $8.8 billion in textile and apparel product to the US market last year. Vietnam's inclusion in the TPP necessitates the need for a well-crafted and balanced agreement which includes yarn forward rule of origin, fair market access provisions, and strong customs rules and enforcement.

Conclusion

After decades of downward pressure on the US manufacturing sector across the board, the US textile industry has not only stabilized, it is expanding in practically every key economic indicator, including:

- Output
- Investment
- Exports

Much of this output, investment, and export growth is due to the yarn forward rule of origin in America's various free trade agreements. As such, NCTO is working to ensure the continued stability in the US textile sector by pressing for a final TPP agreement based on viable and sustainable textile terms. Throughout the negotiations, NCTO and the US industry have remained united and engaged. We have stressed that a strong and time-tested rule of origin, namely yarn forward, is absolutely essential.

Because the industry has been able to demonstrate the tremendous value that strong rules of origin have for textile manufacturing jobs, investment, and exports, the US government has remained steadfast in pursuit of a yarn forward rule of origin in TPP. In addition, we are working with the Obama Administration to ensure that this agreement includes reasonable duty phase-outs on sensitive textile and apparel items. Finally, we are pressing for strong customs enforcement provisions. At this point in the negotiations, it appears that each of these goals is achievable and we applaud the Administration's willingness to consider these critical concerns. With that said, we will monitor this process carefully as TPP countries their efforts to bring the negotiations to a close.

In the coming year, NCTO looks forward to working with lawmakers and the Obama Administration to create a stable and logical policy environment that fully recognizes the value of the US textile industry and its workforce. Achieving this goal will allow domestic textile manufacturers and their hundreds of thousands of employees to continue to see positive growth and investment in the coming years.

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